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Childhood aggression and exposure to violence in the home

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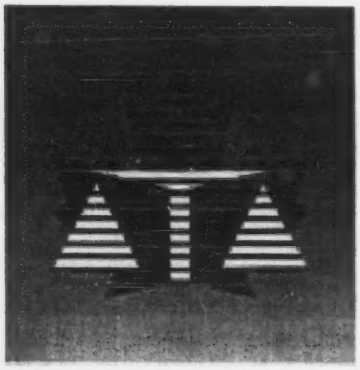

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Tina Hotton, *Statistics Canada*

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Introduction

According to the 1993 Violence Against Women Survey (VAWS), approximately 39% of women who reported they were assaulted by a marital or common-law spouse during their lifetime reported that their children had witnessed the violence against them. Similarly, the more recent 1999 General Social Survey on Victimization found that 37% of women and men who reported they were assaulted by a spouse also reported that their children had heard or seen the violence take place. Both surveys suggest that when children witnessed the violence, victims were more likely to report serious forms of abuse, more likely to suffer physical injury and more likely to fear their lives were in danger at some point during their relationship (Dauvergne and Johnson, 2001).

Evidence shows that exposure to situations of domestic violence can have serious negative effects on a child's development. Social learning theory suggests that children who are exposed to interpersonal violence in the home may also learn to use violence in their own lives (Bandura, 1977). Several studies have shown that children who have witnessed family violence may be more likely to approve of the use of violence for conflict resolution (Carlson, 1991; Jaffe et al., 1986), and are more likely to display violent behaviour themselves (Dauvergne and Johnson, 2001; Singer et al., 1988).

In addition to the direct impact of witnessing violence on child behaviour, children are affected indirectly by family conflict through the breakdown of family relationships (such as inter-marital, sibling, or parent-child relationships). Studies have shown that children who witness violence in the home display higher rates of depression, anxiety and other emotional problems as compared to other children (Dauvergne and Johnson, 2001; Holden and Ritchie, 1991; Hughes et al., 1989; Hughes, 1988).

The long-term consequences of witnessing family violence is also well documented in the research literature. Many studies show that men who witnessed their fathers abuse their mothers are at greater risk of abusing their own partners as adults (American Psychological Association, 1996). According to the 1993 Canadian VAWS, men who witnessed their mothers being physically abused by their fathers as children were three times more likely to be violent in their own marital relationships than men who grew up in non-violent homes (Johnson, 1996). Although most research has focused on male violence toward their partner, there is some evidence that women who witnessed inter-parental violence in childhood have a higher likelihood of using violence against their own spouses or dating partners (Avakame, 1998; Breslin et al., 1990). In addition, women who witnessed their mothers being abused are more likely to have low-self esteem as adults (Silvern et al., 1995), and are significantly more likely to suffer from abuse in their own marital relationships (Dauvergne and Johnson, 2001).

Despite widespread evidence of harmful outcomes for children who witness violence, not all of these children will develop conduct disorders and many adults who witnessed violence as children do not use or experience violence in adult relationships. There are many other important influences in a child's development that can aggravate or mitigate the negative effects of witnessing violence. Research focusing on the resilience and vulnerability of children exposed to family violence has identified a number of individual, family and community support factors that minimize risk among children who witness violence. At the individual level, having high self-esteem and "psychological hardiness" have been identified as protective factors that help to mitigate the effect of witnessing violence, along with the intellectual ability of the child (APA, 1996; Kolbo, 1996; Lynch and Roberts, 1982). Living in otherwise stable and socially connected households with high levels of social support has also been shown to offer a buffering effect, as these children have other sources of emotional support within and outside of the family as well as other models of social interaction (Muller et al., 2000; Kolbo, 1996; Durant et al., 1994).

The present study

This report explores the effect of witnessing violence in the home on aggressive behaviour among children, controlling for other important influences such as parenting practices, community and social support available to the parent and child, child emotional problems, and other socio-demographic factors. The analysis is based on random samples of children and their primary caregivers interviewed for the National Longitudinal Survey of Children and Youth (NLSCY). These children were 6 to 11 years of age in the third cycle of the survey. Given that early child conduct problems are found to be important predictors of crime and delinquency later in life (Loeber and Hay, 1997; Nagin and Paternoster, 1991; Moffitt, 1990), children in this age range are a critical target group for early crime prevention programs.[1]

Data source

The NLSCY, developed jointly by Human Resources Development Canada and Statistics Canada, is a longitudinal survey that follows the development of children in Canada and paints a picture of their lives over time. The survey monitors child development and measures the incidence of various factors that influence development, both positively and negatively.

The first cycle of the NLSCY, conducted in 1994-1995, interviewed parents of approximately 23,000 children up to and including age 11. They reported information not only about their children, but also about themselves and the children's families, schools and neighbourhoods. In the second and third cycles, parents of the same children were interviewed. The NLSCY will continue to collect information on these same children every two years as they move into youth and adulthood.[2] Of the 23,000 selected respondents in 1994/95, approximately 16,900 children were eligible members of the longitudinal panel.[3] The longitudinal sample analyzed in this study consists of approximately 6,700 children 6 to 11 years of age in 1998/99. The longitudinal data was weighted to represent approximately 2,186,600 Canadian children from the 10 provinces in this age group. The 1994/95-1998/99 longitudinal sample was used in this study instead of the cross-sectional 1998/99

sample because one of the central variables in the analysis, whether or not the child witnessed violence in the home, was derived by incorporating information collected across all three cycles of the NLSCY.

Analytical techniques

This analysis used a combination of bivariate and multivariate statistical techniques. The prevalence of exposure to violence in the home was estimated for children 6 to 11 years of age in Canada (Figure 1). Cross tabular analyses were conducted to see the bivariate relationships between exposure to violence and other important factors that may be related to child aggression (Table 1). Multivariate logistic regression models[4] were then fitted to estimate the odds of childhood aggression among children exposed to violence in the home controlling for socio-demographic variables (age and sex of child, family status, and household income adequacy), social support factors (parental social support, neighbourhood cohesion, and religious attendance), parenting style, and child emotional problems (Table 2). Respondents who are missing data for any of the variables used in the logistic regression analysis are excluded. This reduced the sample size for analysis by 9.6% from approximately 6,700 to 6,060 children.

Longitudinal weights were used to account for unequal probabilities of sample selection including non-response due to sample attrition. To account for the complex sample design, the bootstrap technique was used to estimate coefficients of variation, confidence intervals and to test for statistical significance of differences (Rao et al., 1992; Rust and Rao, 1996).

Variables in the analysis

Measuring physical aggression in children

The person most knowledgeable about the child, usually the mother, was asked a series of questions about the frequency with which his/her child engages in *physical aggression*[5] such as fighting, bullying or threatening people. (Refer to Text Box 1). These responses were combined to form a global scale for this type of behaviour which ranged from 0 (those with the lowest reported level of physical aggression) to 12 (those with the highest reported level of aggression). Children were classified as displaying a "high" level of physical aggression if they scored above the 80th percentile on the scale. [6]

Text Box 1: Physical aggression scale items

Parent respondents were asked of their child "How often would you say that he/she ... (never or not true, sometimes or somewhat true, often or very true)"

- Gets into many fights?
- Physically attacks people?
- Acts with anger and fighting?
- Threatens people?
- Is cruel, bullies or is mean to others?
- Kicks, bites, hits other children?

Factors that may influence physical aggression

This study examines the relationships between certain conditions in the child's life and aggressive behaviour. These conditions can be divided into five groups: exposure to violence in the home, parenting practices, social support, child emotional problems, and socio-demographic factors. In addition to examining the direct impact of these conditions on child aggression, the extent to which these conditions mediate or neutralize the negative effects of witnessing violence are explored.

Witnessing violence in the home

The extent of *violence witnessed by children in the home* was determined by asking the primary caregiver to indicate how often their child sees "adults or teenagers in the home physically fighting, hitting or otherwise trying to hurt others". This question was asked of adult respondents at each of the three cycles (1994/95, 1996/97, 1998/99) and those children who were reported to have witnessed violence at anytime in the past were compared with those who did not witness violence in the home. It is important to highlight that this is an indicator of exposure to violence that may involve persons other than parents, such as older siblings and other adults in the home (for other difficulties in measuring exposure to violence in the home please refer to the "Limitations and future research" discussion at the end of this report).

Parenting practices

The importance of parenting practices on healthy child development has long been established. Results of previous studies have shown that harsh parental discipline is one of the best predictors of aggressive behaviour among children and adolescents and that poor parenting practices are strongly associated with a child's escalation from minor aggression to violence (Loeber and Farrington, 2000; Loeber and Stouthamer-Loeber, 1986). In this analysis, parent and child interactions were assessed using the *ineffective/hostile parenting scale.*[7] For this scale, parent respondents were asked seven questions about how they react to their child's behaviour (i.e., how often they use inconsistent punishment, get annoyed and angry at the child, and speak of disapproval instead of praise). Item responses were summed and the resulting scale ranged from 0 (those with the lowest reported level of hostile parenting practices) to 24 (those with the highest reported level of hostile parenting practices).

Social support

In cases of family violence, social support has been found to be important for both parents and children. Parents who are trying to cope with the problem of violence in the home may not have the emotional resources to adequately assess their children's needs, particularly if they are lacking a social support network of friends and other family members. For children, the availability of external support systems is also very important. Supportive relationships outside the immediate family can help to reinforce a child's coping efforts, and may offer them an opportunity to disengage themselves from the conflict (Muller et al., 2000; Kolbo, 1996; Durant et al., 1994; Hetherington, 1992). In this study social support was measured through three concepts: religious attendance, neighbourhood cohesion and parental social support.

Religious attendance: is a dichotomous variable derived from the question "Other than on special occasions (such as weddings or funerals), how often did you attend religious services or meetings in the past 12 months?" The variable contrasts adult respondents who never or rarely attend services or meetings ("at least once a year" or less) with those who frequently attended ("at least once a week" to "at least 3 or 4 times a year").

Neighbourhood cohesion[8]: for this scale, adult respondents were asked five questions about people in their neighbourhoods. They were asked whether people in their neighbourhood are willing to help each other, deal with local problems, keep an eye open for possible trouble, watch out for the safety of neighbourhood children, and whether they are people that their children can look up to. Responses to these questions were combined resulting in a scale ranging from 0 (those reporting the lowest level of social cohesion) to 15 (those living in the most cohesive neighbourhoods).

Parental social support[9]: this scale is based on six questions concerning parental access to social support, including whether they have family and friends that they can trust, talk to for advice, and count on for help. Item responses for the scale were combined with 0 representing the lowest level of parental social support and 18 representing the highest reported level of social support.

Child emotional problems

The emotional health of a child has been identified as an important protective mechanism for children who witness violence. According to a report of the American Psychological Association (1996) children who have high self-esteem and "psychological hardiness" are better able to cope with the experience of witnessing violence and are less likely to become violent themselves. In this study, the measure of child emotional health was derived from an 8-item emotional disorder and anxiety scale. [10] For this scale, parent respondents were asked about the frequency with which their child appears to be unhappy, depressed, worried, nervous or anxious. Scores on this scale ranged from 0 to 16 and were highly skewed in the direction of few emotional problems. To address the problem of non-linearity in this variable, item responses were summed and a dichotomous variable was created in which the highest 20% (those with the highest level of emotional distress) were contrasted with the remaining 80% of children.[11]

Socio-demographic factors

Four socio-demographic variables were also included in this analysis: whether the child lives in a single or dual parent family, the level of family income adequacy, and the sex and age of the child. Several studies have found that children living in single parent households have a higher likelihood of developing behaviour problems, as do children living in poverty (for example, see Tremblay et al., 1997; Loeber and LeBlanc, 1990). Single parents often have less time to devote to child supervision and disciplinary practices than parents in dual-parent families where they can share these responsibilities. Similarly, families living in poverty experience greater stress, and have fewer resources at their disposal to provide them with recreational and other activities that may help children integrate into peer groups (Sampson and Laub, 1993). In this study, a dichotomous variable was created to distinguish families

headed by a single parent with two-parent families in 1998/99.[12] To measure income adequacy, a dichotomous variable was derived which compared those with the lowest and lower-middle levels of income adequacy with those with middle, upper-middle and highest levels of income adequacy (Refer to Text Box 2).

Lastly, the sex and age of the child was included in the analysis to investigate whether the same factors are correlated with aggressive behaviour for boys and girls at different stages in their emotional and cognitive development.

Text Box 2: Income Adequacy

- Lowest: Household income is less than $10,000 and household size is 1-4 persons; or household income is less than $15,000 and household size is 5 or more persons.
- Lower-middle: Household income is $10,000-$14,999 and household size is 1-2 persons; or household income is $10,000-$19,999 and household size is 3-4 persons; or household income is $15,000-$29,999 and household size is 5 or more persons.
- Middle: Household income is $15,000-$29,999 and household size is 1-2 persons; or household income is $20,000-$39,999 and household size is 3-4 persons; or household income is $30,000-$59,999 and household size is 5 or more persons.
- Upper-middle: Household income is $30,000-$59,999 and household size is 1-2 persons; or household income is $40,000-$79,999 and household size is 3-4 persons; or household income is $60,000-$79,999 and household size is 5 or more persons.
- Highest: Household income is $60,000 or more and household size is 1-2 persons; or household income is $80,000 or more and household size is 3 or more persons.

Source: National Longitudinal Survey of Children and Youth User's Guide, 1994/95

Findings

Prevalence of witnessing violence in the home

In 1998/99, approximately 378,000 children between the ages of 6 and 11 in Canada had witnessed violence in the home at some point in their lives. This constitutes approximately 17% of the population in this age group. There was no statistical difference in the proportion of girls (17.7%) and boys (16.9%) who are reported to have witnessed violence in the home (Figure 1).

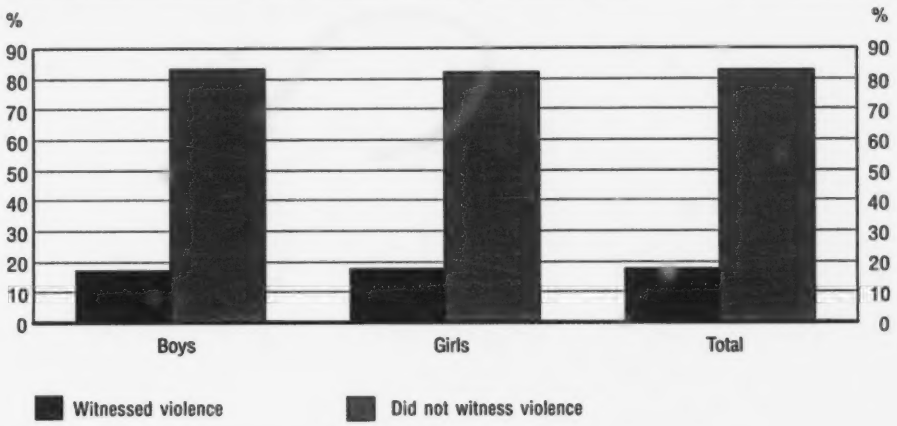
Childhood aggression and witnessing violence in the home

Table 1 shows the proportion of children in the sample who display a high level of aggressive behaviour for each of the risk factors including witnessing violence in the home before controlling for other factors in the child's life.

Exposure to violence in the home has a strong association with aggressive behaviour among children. Approximately 32% of children who witnessed violence at home are reported to have high aggressive behaviour compared with 16% of other children in the sample. Overall, boys showed higher levels of aggressive behaviour than did girls, and this is true for those exposed to violence and those who were not (Figure 2).

Figure 1

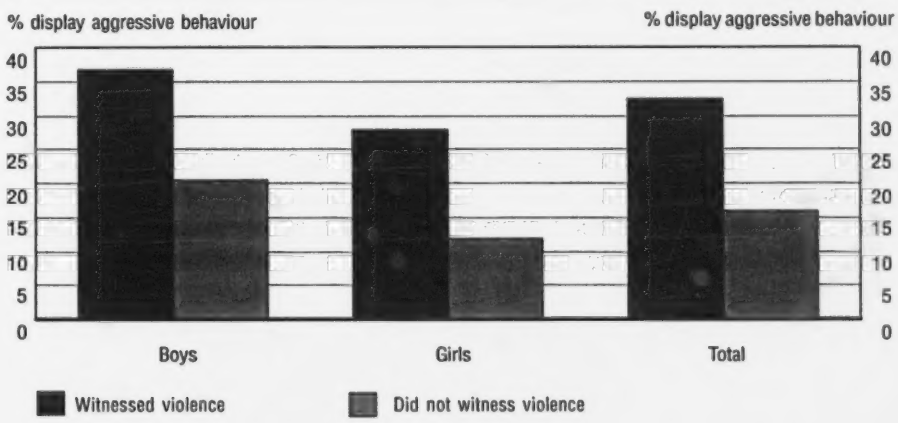
Proportion of boys and girls exposed to violence in the home at any point in the past



Data source: National Longitudinal Survey of Children and Youth (1994/95-1998/99 longitudinal sample)

Figure 2

Prevalence of aggressive behaviour among boys and girls exposed to violence in the home at any point in the past



Data source: National Longitudinal Survey of Children and Youth (1994/95-1998/99 longitudinal sample).

According to previous research, aggressive behavioural problems are more common among younger children, and for most children these problems decline with age (Kerig, 2001). In this study, the average age of children who displayed aggressive behaviour (8.3) is slightly lower than for children who acted out with physical aggression less often (8.5).

Before controlling for other factors, these data suggest that children living in low income families and children living in single parent homes are both more likely to display aggressive behaviour than other children. Approximately 30% of children living in families with low income were identified as having an aggressive behaviour problem compared with 18% of children in higher income families. Among children living in single parent homes, approximately 26% were reported to be aggressive compared with 18% in dual parent families.

Only one of the three community and parental social support factors were found to have an association with child aggression. Children whose families attend religious services infrequently had higher aggressive behaviour than those who attend regularly. Approximately 22% of children who rarely attend religious services displayed high aggressive behaviour compared with 17% with more frequent attendance. The neighbourhood cohesion and parental social support variables are both scales with a range of 0 representing low neighbourhood cohesion and a lack of social support to a high of 15 for a highly connected neighbourhood and 20 for very strong parental social support. The mean score on both of these scales were not significantly different for children who have an aggressive behaviour problem than those who do not.

Hostile parenting practices are related to aggressive child behaviour among children in the sample. The mean score on the ineffective and hostile parenting scale is 17.1 among children who often display aggressive behaviour compared with 14.9 for children who display aggressive conduct problems less often.

Children with high emotional anxiety were also more likely to display aggressive behaviour problems than other children. Approximately 38% with high emotional anxiety had an aggressive behaviour problem compared with 14% with lower emotional anxiety.

Comparing aggressive behaviour among boys and girls, controlling for witnessing violence and other factors

Table 1 shows that many factors may be associated with childhood aggression, but because of the interconnections among them, we must examine them together in a procedure that "controls" for the effects of all these factors simultaneously. Two variables that were included in the previous analysis – neighbourhood cohesion and parental social support – were not included in the regression model because neither was shown to significantly increase risk of aggressive conduct problems among children in the bivariate analysis. Table 2 presents the multiple logistic regression results, and shows which factors remain important correlates of child aggression after taking into account the impact of other factors.

Table 1

Prevalence of aggressive behaviour among children 6 to 11 years of age by selected characteristics, 1994/95-1998/99

	High aggression (80th percentile and above)			Lower aggression (below the 80th percentile)		
	%	Mean	95% Confidence interval	%	Mean	95% Confidence interval
Child witnessed violence in the home						
Yes	32.3 *		(27.4, 37.3)	67.7		(62.8, 72.6)
No	16.4		(14.7, 18.0)	83.6		(82.0, 85.3)
Socio-demographic factors						
Sex of child						
Male	23.2 *		(20.9, 25.6)	76.8		(74.4, 79.1)
Female	14.8		(12.9, 16.7)	85.2		(83.3, 87.1)
Age of child		8.3 *	(8.2, 8.4)		8.5	(8.5, 8.5)
Income adequacy						
Low income	30.3 *		(24.9, 35.8)	69.7		(64.3, 75.1)
Middle/high income	17.8		(16.2, 19.4)	82.2		(80.6, 83.8)
Intact family status						
Single parent	26.1 *		(19.4, 24.8)	73.9		(69.3, 78.5)
Dual parent	17.8		(15.2, 19.0)	82.2		(80.5, 83.9)
Social support factors						
Neighbourhood cohesion		9.4	(9.2, 9.7)		9.2	(9.1, 9.3)
Parental social support		15.2	(15.1, 15.3)		15.1	(15.1, 15.2)
Religious attendance						
Infrequent/never	22.1 *		(21.5, 30.7)	77.9		(75.2, 80.6)
Regular	17.1		(16.1, 19.5)	82.9		(81.0, 84.8)
Parenting style						
Ineffective/hostile parenting style		17.1 *	(16.9, 17.4)		14.9	(14.8, 15.1)
Child emotional problems/anxiety						
Higher anxiety	37.5 *		(33.0, 42.1)	62.5		(57.9, 67.0)
Lower anxiety	13.9		(12.3, 15.4)	86.1		(84.6, 87.7)

* Difference is statistically significant (p<.05).

Data source: National Longitudinal Survey of Children and Youth (1994/95-1998/99 longitudinal sample).

Text Box 3: What is an odds ratio?

An odds ratio is a statistic generated by a logistic regression and can be used to assess whether, other things being equal, children with specific characteristics are more or less likely to display aggressive behaviour than those in another group, referred to as the reference category. For example, consider the risk of aggression for children who witness violence at home compared to those who have never witnessed violence in the home (the reference category). An odds ratio near 1.0 implies there is no difference in aggression between the two groups; an odds ratio greater than 1.0 implies those in the group being considered (children who witness violence in the home) are more likely to be aggressive than those in the reference group (children who did not witness violence) and an odds ratio less than 1.0 implies those in the group being considered are less likely to be aggressive than those in the reference category.

When an explanatory variable is continuous (e.g. age measured in years), the odds ratio tells how many times the ratio P/(1-P) is greater or smaller for an individual who is one year older than another individual. For example, an odds ratio of 2.0 indicates that the odds of displaying high aggressive behaviour are twice as high for an 11 year old as they are for a 10 year old.

The odds of displaying aggressive behaviour continues to be higher for children who witness violence in the home, even after controlling for socio-demographic, social support, parenting and child emotional problems. Children who witness violence in the home have more than double the odds of acting out aggressively (2.2) than do children who never witness violence. The interaction between exposure to violence in the home and the sex and age of the child was also examined, but did not reveal a differential effect of witnessing violence on aggressive behaviour for boys over girls, or younger children over that of older children (results not presented in table form).

Among the socio-demographic variables tested in this model, three of the four were found to increase the odds of child aggressive conduct problems, being younger, male, and having a low income. The odds of displaying high aggression decrease by a factor of .93 for every year increase in the age of the child. Although this effect appears to be quite small, this is due in part to the small unit of measurement (1 year). If the effect of age were to be analysed over a three-year interval, the odds of aggressive conduct problems among children decrease by a factor of .80.

The odds of high aggression are 1.9 times higher for boys than girls in the sample, and 1.8 times higher for children in low income families. After adjusting for the effects of a number of other important factors in a child's life, those living in single parent families were no more likely to display high aggressive behaviour than children living in two-parent families.[13]

Similar to previous studies (Loeber and Farrington, 2000; Brannigan et al., 2001), hostile parenting was shown to increase the odds of aggressive behaviour for children. The odds of having an aggressive behaviour problem are considerably higher among children whose parents use hostile parenting techniques (such as getting angry or annoyed at the child, focusing on negative rather than positive child behaviours) as compared to those whose parents use these parenting styles less often. For every point increase on the hostile parenting scale, the odds of having high aggressive behaviour increased by a factor of 1.2.

Table 2

Adjusted odds ratios for the risk of high aggressive behaviour among children 6 to 11 years of age in 1998/99 by selected characteristics (N=6065)

	Odds ratio	95% confidence interval
Child witnessed violence in home	2.24 *	(1.66, 3.02)
Socio-demographic factors		
Male child	1.86 *	(1.51, 2.29)
Age of child	0.93 *	(0.88, 0.99)
Low income adequacy	1.77 *	(1.26, 2.49)
Single parent family	1.07	(0.79, 1.46)
Social support factors		
Infrequent/no religious attendance	1.17	(0.94, 1.45)
Parenting style		
Ineffective/hostile parenting	1.24 *	(1.20, 1.28)
Individual level child factors		
Child emotional problems/anxiety	2.60 *	(2.01, 3.36)

* Statistically significant (p<.05).

Data source: National Longitudinal Survey of Children and Youth (1994/95-1998/99 longitudinal sample).

When effects of other factors were controlled, the only measure of social support that was significant in bivariate analysis, religious attendance, ceased to be a significant risk factor for aggressive behaviour. However, child emotional problems continued to have a strong association with aggressive behaviour. The odds of having an aggressive conduct problem are more than two and a half times higher (2.6) for children who scored above the 80th percentile on the emotional anxiety scale.[14]

Discussion

Not all children who witness violence in the home develop aggressive behaviour problems themselves. Although children exposed to violence in the home are more likely to act out aggressively than are other children, the majority (approximately 68%) of children who witnessed violence in the home do not act out with aggressive behaviour. There are, however, important factors that can increase or reduce the negative impact of this experience.

This study suggests that parenting practices can reduce or intensify conduct problems among children. Children are less likely to act out aggressively when their parents use more effective parenting techniques than those who rely on hostile techniques such as reacting to their child's behaviour with anger, and using negative rather than positive reinforcement. As Lytton (1990) suggests, the relationship between child behavioural problems and parenting is likely a circular problem. Children themselves differentially trigger parenting styles as a result of their behaviour, which can in turn exacerbate the antisocial behaviour that it is intended to address.

Consistent with earlier research (see Sprott and Doob, 1998), this study suggests that children who are generally happy, with lower levels of depression and anxiety are less likely to have aggressive conduct problems than children with higher emotional anxiety. Gaining the ability to regulate one's emotions and resolve conflicts

without resorting to aggression is an important step in the child development process. Parents have a key role in socializing and supporting this emotional development, and this is particularly important for children dealing with the confusing and often traumatizing emotional demands of living in high conflict households (Committee on Integrating the Science of Early Childhood Development, 2000). The NLSCY shows that child depression and anxiety is highly correlated with parental depression, which makes addressing child conduct problems even more challenging, as they are "often deprived of the parent as a resource for managing these powerful emotions" (Committee on Integrating the Science of Early Childhood Development, 2000:108).

For this reason social support outside the family unit is particularly important as an alternative resource for children. This study, however, did not find a significant relationship between low parental and community social support and child aggression, nor did it find that social support mediated the relationship between exposure to violence and aggressive behaviour. The measures of social support used in this analysis largely focused on the support available to parents through religious attendance, community ties and the availability of friends and family to turn to for support. It may be, however, that the social resources directly available to children are more important than what they gain indirectly through their parents. As Hetherington (1992) suggests, children exposed to marital conflict are better able to cope if they have close peer relationships and positive and distracting activities outside the home that enable them to distance and disengage themselves from the conflict. Direct measures of peer support, academic and extracurricular engagement will be available in future cycles of the NLSCY as the children in this sample enter adolescence but are not available for these younger groups of children.

Consistent with previous research on gender differences in aggression, boys in the study had higher odds of engaging in aggressive behaviour than did girls. This observation is not surprising given that girls experience more pressure to refrain from aggressive behaviour than do boys and awareness of this disapproval starts at a young age (Crockenberg and Langrock, 2001). Given this strong disapproval of female aggression, girls learn to suppress their anger making them more susceptible to internalizing symptoms – such as indirect forms of aggression (see Dauvergne and Johnson, 2001).

Although boys in the study were more likely to display aggressive behaviour, this study did not find that exposure to violence in the home differentially impacted boys' aggressive behaviour over that of girls showing some similarity in experience.

Child development research shows us that the ability to self-regulate, or manage stress through cognition rather than behaviour, improves with age as children expand their range of coping skills (Kerig, 2001). Among children in this study high aggressive behaviour declined with age. This is true of both children exposed to violence in the home and those who were not. Ideally one should explore the impact of first exposure to violence on children at different stages of their emotional and psychological development. Previous research has identified some unique symptoms associated with exposure of violence at different developmental stages, ranging from the neural development of infants to emotional and behavioural problems among school age children and adolescents (Perry, 1997; Jaffe et al., 1990; Sternberg et al., 1993). Unfortunately, the timing of first exposure to violence was not captured in the NLSCY, and parent respondents reported on the frequency of witnessing violence in general making it difficult to isolate these occurrences at any specific point in time.

Limitations and future research

As in any study, readers should be aware of possible limitations with the data source or measures used in the analysis. The NLSCY was designed to measure a variety of family, peer, school and community influences on children and it was not intended to directly estimate the number of children exposed to domestic violence. Parent respondents were asked to estimate "how often their children see adults or teenagers in the home physically fighting, hitting or otherwise trying to hurt others". This is an indicator of exposure to violence that may involve persons other than parents, such as older siblings[15] or other adults in the home.

Further, responses to this survey question were given by parent respondents, who may under-report the incidence or frequency that their children witnessed violence in the home. Previous studies of family violence have shown that parents often falsely report that their children were unaware of parental violence when the children report awareness of it (O'Brien et al., 1994; Jaffe et al., 1990). Lastly, the NLSCY does not directly measure child abuse and we do not know if the children who reportedly witnessed violence in the home were also targets of violence. Some studies have found that witnessing violence in the home and suffering abuse is doubly disadvantageous for children. Children who were both abused and witnessed parental violence were found to exhibit the most problem behaviours, followed by children who only witnessed the violent event(s) (McCloskey et al., 1995; Hughes et al., 1989).

This study also raises a number of important questions to be addressed in future research. The current analysis relied solely on parent respondent assessments of their child's use of physical aggression. For children in this age group it is also possible to explore child conduct disorders from the perspective of teacher respondents.[16] Previous analyses have shown that children identified as being "highly" aggressive can differ considerably depending on who is being asked (parent, child or teacher), and we should not necessarily expect behavioural consistency across situations (Sprott and Doob, 1998). For example, children may not display conduct problems at school but act out at home (or vice versa). The developmental pathway towards serious offending usually starts with persistent disruptive behaviour in the home, which then spreads to delinquent acts at school and in the community (Loeber and Farrington, 2000). Further analysis examining the impact of exposure to violence at home on behaviour in other social contexts such as the school environment would prove beneficial. Future work will build on this analysis to examine the likelihood that children who witness violence in the home will develop more serious emotional problems, and will engage in delinquent activities as they enter the age of criminal responsibility.

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Endnotes

1. For more information on crime prevention programs in Canada aimed at children at risk please see the National Crime Prevention Centre (NCPC) website (http://www.crime-prevention.org).
2. More information is available in the NSLCY Survey Overview http://www.statcan.ca/english/freepub/89F0078XIE/99003.pdf
3. Only those respondents that completed all three cycles of the survey were eligible members of the longitudinal panel.
4. Logistic regression techniques are used in this analysis instead of linear ordinary least squares regression because scores for the aggressive behaviour scale are highly skewed. When the dependent variable has a skewed distribution, assuming linearity, as in ordinary least squares (OLS) regression, can lead to inefficient and biased estimates.
5. The reliability coefficient (Cronbach's Alpha) for the physical aggression scale is á =.78. Cronbach's alpha is a measure of internal consistency, based on the average correlation between items. It is assumed that items are positively correlated with each other because they are attempting to measure a common construct; therefore, a Cronbach's alpha close to 1 indicates a perfect consistency between items. A suggested level of reliability is typically 0.80 or greater; however, this may vary by the type of data.
6. Given the 12-point distribution of scores on the physical aggression scale, ideally one would treat the variable as linear and use linear regression techniques, or divide the scale in equal quarters or thirds and use ordered logistic regression techniques. In this case, the distribution on the aggression scale was too skewed to treat as linear, and most parent respondents (44%) indicated that their child did not have a problem with physical aggressiveness (score of 0), making the equal division of the scale problematic. Consequently one could explore the more serious cases of aggression by focusing on children who score above the 70th, 80th, or 90th percentiles on the scale, or focus on children who scored above average on the physical aggression scale. As we are more interested in the serious cases of aggressive behaviour, we chose to explore children who scored toward the high end of the scale (in this case above the 80th percentile). In general, the results are robust across the three cut-off points, and any significant variation in the conclusions drawn from alternative cut-off points are noted throughout the discussion.
7. The reliability coefficient (Cronbach's Alpha) for the ineffective/hostile parenting scale is α =.68.
8. The reliability coefficient (Cronbach's Alpha) for the neighbourhood cohesion scale is α =.86.
9. The reliability coefficient (Cronbach's Alpha) for the parental social support scale is α =.84.
10. The reliability coefficient (Cronbach's Alpha) for the child emotional problems/anxiety scale is α =.80.
11. The impact of measuring "high" emotional anxiety using different scale cut-offs (such as the 70th percentile or the 90th percentile) were explored to ensure that the reported findings are reliable. Any significant differences are footnoted in the discussion.
12. No significant differences in aggression were found among children living in blended families (with one step-parent) and those living with two biological parents. Consequently, these two groups were combined into the category "dual parent families" to simplify the model.

13. The interaction between living in a low income household and being raised by a single parent was tested to see if there is a conditional effect (i.e., to see if it is not necessarily living in a single parent family that increases risk, but the combination of living with a single parent and having a lack of financial resources at their disposal), but the odds of displaying an aggressive conduct problem were not higher for these children.

14. The results of the logistic regression analysis do not differ significantly if "high" emotional anxiety is measured using an alternative scale cut-offs (such as the 70th or 90th percentile).

15. According to data from the third cycle of the NLSCY, there were no teenage siblings living in the home in approximately one third of cases (Dauvergne & Johnson, 2001).

16. In addition, using information from different sources has the advantage of reducing the possibility of shared informant bias. Relying on a single respondent can increase the possibility of having inflated relationships between variables in the analysis.

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